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Are Defense Expenditures Pro Poor or Anti Poor in Pakistan? An Empirical Investigation

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I. INTRODUCTION

Recent increase in defense expenditure (Dexp hereinafter) in Pakistan due to increase in internal security and terrorism is an issue of concern to many Pakistani and other stakeholders in the Pakistan economy. Presently, internal security issues especially that of the increasingly violent homegrown terrorism is forcing increasing financial cost on government's expenditure towards defense sector. According to Budget documents, defense budget amounts to Rs 700. 2 billion for the 2014-15 fiscal year compared with Rs 627.2 billion allocated in the preceding fiscal year, showing an increase of Rs 73 billion. However, these figures do not include Rs 163.4 billion allocated for pensions of the military personnel.[1] In addition to this, military would also be given Rs 165 billion under the contingent liability and Rs 85 billion under the Coalition Support Fund (CSF). This means that in reality Rs 1113 billion has been allocated for the military which is about 28.2 percent of the country's total budget [Sheikh and Yousaf (2014)]. This has led to diversion of the money needed for much-needed development projects, as the share of current expenditure in total budgetary outlay for 2014-15 is 80.5 percent.[2] This diversion of funds has economic implication since some social sectors are likely to suffer in Pakistan.

Military expenditure retard development by diverting government resources that could be used for public services, infrastructure, or lower taxes [Collier (2006)]. This view has been expressed by the UN Committee for Development Planning which states that the single and the most massive obstacle to development is the worldwide expenditure on national defense activity [Olofin (2012)]. The adverse effects of increased Dexp in a developing country such as Pakistan are likely to exacerbate the existed poverty since almost all the military hardwares are imported. According to the Stockholm International Peace Research Institute (SIPRI) statistics, Pakistan stands at third position

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[1]There is no generally agreed definition of military expenditure worldwide. Stockholm International Peace Research Institute (SIPRI), Sweden includes in its definition of military expenditure all costs incurred as a result of current military activities. It includes retirement pensions. The International Monetary Fund's Government Financial Statistics Yearbook (GFSY) collects expenditure data according to a functional classification which places military pensions within the social security function, military healthcare within the health function, etc. Government of Pakistan also put military pensions under the civilian budget.

[2]*Economic Survey of Pakistan 2013-14.*

with global share of 5 percent of major arms importer for the 2009-2013 [Wezeman and Wezeman (2014)].

The adverse effects of Dexp have not deterred countries from stockpiling military arsenals. According to Stockholm International Peace Research Institute (SIPRI), world military expenditure in 2012 is estimated to have been $1756 billion, representing 2.5 percent of global gross domestic product (GDP) or $249 for each person in the world. During the last fiscal year 2012, Pakistan spent Rs 507.159 billion on defense sector which constitutes 12.9 percent of total federal government expenditures. Unfortunately, Pakistan is still among the poorest countries and the per capita gross national income for Pakistan was US$ 1261 which is 143rd among 182 countries in the world in the same year.[3] Thus on the one hand, Pakistan is facing several problems such as poverty, poor infrastructure and poor health status. On the other hand, Pakistan does spend a considerable amount on military expenditure which might use scarce resources and crowd out growth-leading expenditures such as health and education expenditures.

A large chunk of population in Pakistan is living below the poverty line. Statistics show that 45.7 percent people (Approximately 82 million) in Pakistan are living below the poverty line. And out of these 45.7 percent people 36.5 percent million (Approximately 65 million) of the total population are living in chronic poverty [Adnan (2012)]. On the other hand, the large size of Dexp in presence of high budget deficits, declining development expenditure and increasing debt services on account of exploding public debt got the attention of researcher on the subject. Besides these factors, Pakistan's pursuit of nuclear capability, its arms race with its India and incidence of poverty also got the attention of foreign researchers [Khan (2004)].

For policy purposes, it is very important to determine the channels by which Dexp influence the economic growth process. For the policy makers, the impact of Dexp on economic development, which can be positive or negative, can have different implications with respect to what strategy to apply to stimulate economic growth [Braşoveanu (2010)]. The issue of Dexp is widely debated in the literature. Defense expenditure can affect the economy either negatively or positively. They are considered as unproductive, have higher opportunity costs and crowd out investment. They retard the pace of the economic growth by distorting the resource allocation. But contrary to this view, they also have growth-promoting potentials, cause expansion of aggregate demand, production and employment generation. They exhibit spillover effects on the economy. The empirical literature is divided between pro and against school of thoughts. The former group is less dominant in the literature [Frederiksen and Mcnab (2001); Hassan, *et al.* (2003); Halicioglu (2004); Yildirim, Sezgin, and Ocal (2005); Bose, *et al.* (2007); Ando (2009) which enlist the positive effects of Dexp on economic growth. The latter group of researcher find adverse of effects of Dexp on economic growth [Abu-Bader and Abu-Qarn (2003); Galvin (2003); Klein (2004); Karagol and Palaz (2004); Kentor and Kick (2008); Smith and Tuttle (2008); Mylonidis (2008); Hou (2010); Dunne (2010); Braşoveanu (2010); Iftikhar ul Husnain and Shaheen (2011); Dunne and Tian (2013)].

There is extensive literature available on the relationship between Dexp and economic growth, but there are a few studies on the impact of Dexp on poverty [Olofin (2012); Henderson (1998)]. To the best of our knowledge, no study has empirically

[3]Data refer mostly to the year 2012. World Economic Outlook Database-October 2013, International Monetary Fund. Accessed on 8 October 2013.

examined the impact of the Dexp on poverty level in Pakistan.[4] Thus, this study intends to fill the gap by examining the impact of Dexp and some other explanatory variables on poverty level in Pakistan. Therefore, the goal of this paper is to analyze the relationship between Dexp and poverty in Pakistan along with other explanatory variables like GDP, population, Foreign Direct Investment (FDI), Inflation and public spending on Education and has tried to find out the existence, direction and intensity of this connection.

The remaining part of the paper is organised as: Section II provides the glimpse of Dexp in Pakistan, Section III gives the theoretical understanding and review the available literature on the topic, Section IV describes the research methods undertaken to achieve the objectives and gives data sources, Section V discusses the results and lastly conclusion and policy implications are given.

II. TRENDS IN DEFENSE EXPENDITURES OF PAKISTAN

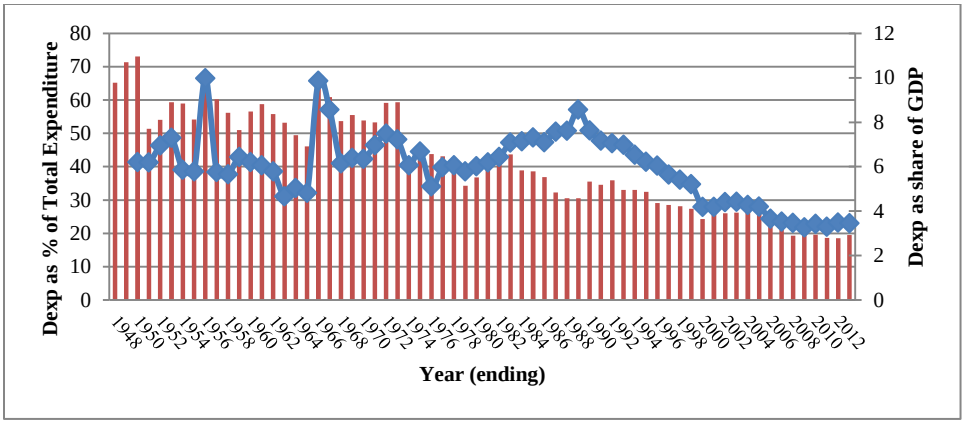
The trend of Pakistan's Dexp (as a proportion of GDP) is shown in Figure 1. The range of Dexp is from 3.3 per cent to 9.97 per cent. Pakistan's Dexp remained one of the largest components of total government expenditures since independence. Although sizeable variation in Dexp to GDP ratio has been witnessed over the past five decades and the ratio declined significantly with the advent of the 21st century, the absolute size of Dexp is considered still very high. The defence expenditure were considerably high during the initial years after independence, it remained 6.4 percent during the first half of 1950s. It rose to 9.97 percent in the year of 1956. This exceptionally high share of Dexp in early years of independence may be largely attributable to the government efforts to achieve a minimum level of deterrence, necessitated by the hegemonic attitude of India towards Pakistan.

Afterwards, the share of defence expenditure witnessed a considerable decline with some fluctuations before spiking up again in year 1966 on account of 1965 war with India. In the post-1965 war era, the defence expenditure saw a modest decline. However, this decline proved short lived, as ratio surged again in the fiscal year 1972 due to 1971 war. The post-1971 war period saw a decline and it remained 6.11percent till 1980. However, the declining trend once again reversed during the decade of 1980s as Pakistan got involved in war against Soviet Union occupation in Afghanistan. The average Dexp remained during the period was 7.26 percent.

The withdrawal of Russian forces from Afghanistan coupled with the prevalence of high fiscal deficits propelled government to revisit its defence spending. As a result, the decade of 1990s recorded considerable decline in the share of Dexp [Khan (2004)]. The decline in second half of 1990s was more pronounced compared to the first half. Despite tensions on borders with Afghanistan (following the September 11 incident) and India (due to incident of December 13), the share of Dexp continued to decline and averaged 4.29 percent during first half of 21st century. The second half is averaged 3.46 percent despite Pakistan is a front line state in war against terrorism. But Dexp once against has started climbing up.

Fig. 1. Defense Expenditure Profile of Pakistan (1947–2013)

[4]Kalim and Hassan (2013) Presented conference paper on "Military expenditure and poverty in Pakistan: a complex phenomenon" at 3rd International Conference on Business Management organised by University of Management and Technology, Lahore. Paper was subsequently published in Conference Proceedings.



Data Sources:

(a) Singh and Cheema (2000).

(b) *World Development Indicators* (Online).

The share of Dexp to the total federal government expenditure (FGE) is also an important indicator to understand the pattern of Pakistan's Dexp. Figure (1) also gives time-series data for Pakistan's Dexp as share in the total federal government expenditure. During the period 1948-1960, the defense share was almost 60 percent of FGE. The average share of the decade of 1960s was 56 percent. After that it started declining and it averaged 43 percent during 1970s. Since 1970s defense share in FGE showed a sharp decline. In 2013, Dexp constitutes 19.47 percent of total federal government expenditure.[5]

To sum up the discussion, Pakistan's defense burden historically has been higher especially during the tension period of war with India and front line state against Soviet aggression of Afghanistan. The share of non-development expenditure has been alarming disproportionate to development expenditure. And the share of Dexp in the current expenditure has been on higher side. This defense share promotes the economic growth and retards it; this is the question of empirics.

III. THEORETICAL UNDERPINNING AND REVIEW OF LITERATURE

The use of government expenditure as a fiscal policy tool is well established; however the usefulness of Dexp as a tool of fiscal policy especially for developing countries is yet to be established. Theoretical background on the relationship between Dexp and economic growth argues both positive as well as negative relationship. The positive correlation between Dexp and economic growth springs out from the theory of military Keynesianism. The advocates of the theory argue that as Dexp is part of the budgetary outlay and the government has a considerable control over it. Therefore having positive effects on economy, it can be used as a fiscal instrument to stabilise the economy when it is needed [Khan (2004)]. In order to achieve economic growth, the government should enhance defence spending Peter (2010) and Veronique de Rugy (2012)]. The theory focuses on Dexp as a component of aggregate demand and spillover effect of these spending also explains the economic effect of Dexp. Increased aggregate demand due to high Dexp will add in economy's output and generate employment [Alpetekan and Levine (2009)].

[5]This data is according to World Development Indicators (WDIs) database. But according to *Economic Survey of Pakistan 2013-2014*, defense expenditures accounted for 11.2 percent in 2012-13.

Braşoveanu (2010) and Pardhan (2010) enlist positive and negative effects of defence spending. Some of these positives are summarised here as follows:

- Dexp promotes Research and Developments (R&D) in defense sector which brings technological innovations and this technological spill-overs applied to civil sector can enhance economic growth.
- Dexp promotes economic growth, if some of the expenditure is used for the creation of public infrastructure development and human capital formation.
- Dexp provides security which promotes a stable business environment, a necessary condition for encouraging foreign investment and market exchange.
- Dexp can improve productivity and generate welfare, if the part of spending is used for revamping the economy during crisis times like earthquake, floods, terrorist attacks and so forth.
- Dexp in the period of unemployment provides stimulate effect to economic growth as it causes an expansion of aggregate demand.

On the other hand, there are arguments regarding the negative relationship between Dexp and economic growth. Some of them are summarised here as follows:

- Dexp can adversely effect economic growth by crowding-out private investment. This is classical and neoclassical argument: an increase in public spending substitutes public goods for private goods. The higher Dexp generates a distortion in resource allocation and the diversion of resources from productive activities to the accumulation of military arsenal.
- Dexp has the opportunity cost as these expenditures hinder economic development by reducing savings and misallocating resources away from more productive use in the public or private sector. The resources spent on preparation for war and on war-fighting could be better employed on more productive avenues.
- Dexp may further bring constraints on budget. If financed by non-distorting revenues, has a positive effect on economic growth; if financed by distorting revenues, it might have a positive or negative effect on economic growth, depending on the level of the Dexp.
- Dexp may affect efficient resource allocation as it is not governed by market processes, so it tends to create distortions in relative prices.
- Dexp may be driven not by security needs, but by a rent seeking military industrial complex, and may cause arms races or damaging war.
- Under the assumption of fixed government expenditure, high defence expenditure undermines the government efforts to spend more on infrastructure, which is a prerequisite for economic growth.

The first seminal empirical study on the relationship between Dexp and economic growth was carried out by Benoit (1973, 78). He studied 44 less developed countries (LDCs) for the period 1950-65 and found a positive link between Dexp and economic growth. Benoit (1978) proposes a neo-classical supply side explanation on the link between Dexp and growth where Dexp can affect growth in two directions, negatively and positively. It affects negatively by taking away the resources which may be better used in civilian economy, and it affects positively by providing jobs and increasing employment, involving in infrastructure, training and research and development (R&D). The works of Benoit have been criticized on account of his conclusions and methodology

by later researchers. But his empirical work induced more research and the subsequent research has been greatly influenced by his postulates [Alpetekan and Levine (2009)].

The opinions of the researchers are divided on the account of the effects of Dexp. The "pro" group of researchers view Dexp is a guarantee of peace, security and welfare. This school of thought believes that Dexp increases purchasing power and brings improvements in human and physical capital in addition to direct technology benefits that enhance economic growth [Benoit (1978); Beenstock (1998); Sezgin (2001); Atesoglu (2002); Yildirim, Sezgin, and Ocal (2005)]. The other "against" group of researchers sees Dexp as a wasteful enterprise that influences the economy beyond the resources it takes up. The Dexp is a consumption good that reduces saving and crowds out private investment and affects growth negatively. Moreover Dexp diverts resources from productive uses to unproductive uses [Karagol and Palaz (2004); Dunne and Tian (2013)]. Researchers have also found that Dexp has neither positive nor negative effect on growth [Al-Yousif (2002)]. The question of link between Dexp and economic growth is empirical in nature.[6]

As evident from the above narration, the findings of the empirical literature are contradictory. Some are getting support of the positive relationship between Dexp and economic growth, while others do not. The reasons on having varying results could be attributed to sample size, method applied, time period, other control variables and the functional form used in the analysis. Therefore, the empirical studies must be interpreted with underpinning hypotheses tested and the other conditioning variables used [Dunne (1996)].

The literature review reveals that numerous studies have been conducted to explore the relationship between Dexp and economic growth and the possible spillover effects of Dexp. But few studies have taken to explore the direct relationship between Dexp and poverty. Recently, the study [Olofin (2012)] considered the poverty among Nigerians and uses principal component analysis to create a poverty index as a dependent variable and also uses infant mortality rate as second dependent variable used in Dynamic OLS model. The study finds that capital intensiveness of the military and the participation rate have important implication on poverty level in Nigeria. Findings rebut the Keynesian argument that defense spending is positively related to well-being. In the case of Pakistan, Kalim and Hassan (2013) investigate the impact of military expenditures on poverty along with inflation, industrialization, service sector, and FDI for both long term and short term for the period of 1972-2009. The findings show that military expenditures are significantly elevating poverty in both long-term and short-term.

Keeping this gap in literature on exploring direct relationship between Dexp and poverty, the objective of the study is to verify the military Keynesian hypothesis of negative relation between Dexp and poverty level. The study uses literature-supported determinants of poverty alongwith Dexp.

III. DATA SOURCES AND RESEARCH METHOD

[6] For survey of literature, see Nijkamp and Poot (2004), Alpetekan and Levine (2009), and Dunne and Uye (2010).

The data on Poverty (Head Count Ratio) have been taken from the study done by Jamal (2006)[7] and data on Dexp have been was taken from the Federal Bureau of Statistics' publication "50 Years of Pakistan" and Economic Survey of Pakistan (various issues). The data on GDP, Public spending on education, Population and Inflation have been from the World Development Indicators database available on online from the data bank of World Bank while the data on FDI have been taken from UNCTAD. The time period covered in the study is from 1973 to 2011. Both short term and long term relationships between Dexp and poverty have been computed, where Poverty (HCR) is dependent variable and Defense Expenditure (DX) is independent variable. Other explanatory variables are Foreign Direct Investment (FDI), Inflation (INF), Gross Domestic Product (GDP), Public Spending on Education (SEDU), and Population (POP). All variables are in log form. Literature on Log Linear Approach made by various researches such as Ehrlich (1977), Layson (1983), Bowers and Pierce (1975), Cameron (1994) and Ehrlich (1996) validated that empirical findings computed through Log Linear Approach are more consistent than that of Functional method.

The choice of the independent variables is motivated by the related existing empirical studies focusing on the determinants of poverty and the availability of data. The studies [Hassan and Siddiqi (2010); Jamal (2006); Kalim and Hassan (2013)] lead us to select a set of these variables that are widely used and found to be significant determinants of poverty. A description along with hypotheses of all the variables of the model is given below in detail:

Head Count Ratio (HCR) has been used as a proxy for Poverty. It is obtained by taking the ratio of the total number of people who are below the poverty line to the total population.

Defense Expenditures (DX) are perceived that whenever any government allocates a major share of its GDP to defense sector then it will eventually add to poverty of the country. Therefore, in order to control the cancer like poverty, resources may be allocated to development and productive side rather on non-productive side.

Hypothesis: Dexp has a negative relation with poverty level (the Keynesian hypothesis).

Inflation (INF) Although there are many contributing factors of poverty but inflation is considered as an influential factor. The problem of poverty intensifies even more when the prices of commodities in general and food in particular increase. Several arguments have been made in support of the view that inflation increases poverty [Braumann (2004); Chaudhry and Chaudhry (2008)].

Hypothesis: Inflation is positively related with poverty (Inflation increases poverty by increasing cost of living).

Foreign Direct Investment (FDI) is the most useful tool for economic development and long run growth for a country in comparison to other forms of capital inflows. It stimulates the economy which adapts the advanced technological and management skills [Lipsey (2002); Johnson (2006)]. The rapidly growing economies tend to absorb more FDI for its further contribution to economic growth [Walsh and Yu (2010)]. Moreover, FDI also exhibit its positivity associated with social uplift of the people by improving their standard of living [Srinivasan (1983); Gonzalez (1998)]. FDI could also create a virtuous circle of confidence building for the host country. The

[7]Data is upto 2003, for remaining of years of the study; data was taken from *Economic Survey of Pakistan.*

inflows of FDI reinforce local investment environment that subsequently affects both local and foreign investment [Khan and Yun-Hwan (1999)]. Hence, FDI is considered to be one of the important factors of economic growth. It can play significant role in achieving the country's socio-economic objectives for example jobs creation, poverty eradication and technological advancement.

Hypothesis: FDI is Negatively Related with Poverty (FDI Reduces Poverty).

Gross Domestic Product (GDP) show the production of goods and services in given period of time which is normally one year. Increase in GDP is positively related with poverty. As the GDP increases, people get new jobs hence increase in their income level and it also reduces poverty.

Hypothesis: The GDP is negatively related with Poverty (GDP has spill over effect on Poverty).

Public Spending on Education (SEDU) In traditional neoclassical growth theory, education is emphasized as the main source of human capital formation and ultimately a crucial tool for growth and poverty avoidance. Education remains the key not only to employment in the formal sector but also to various opportunities to better living conditions, though access to education remains uneven for both men and women [Ajakaiye and Adeyeye (2001)].

Hypothesis: Public Spending on Education is negatively related with Poverty (Public Spending on Education reduces poverty).

Population (POP) has the potential to impact all aspects of poverty. The relationship between population growth and incidence of poverty has been debated for more than a century. But there is a general consensus among different school of thought that population growth has some relationship with poverty. In Pakistan, population growth has eroded fruits of higher economic growth. It is considered a cause for poverty [Mallick and Ghani (2005)].

Hypothesis: Population has a positive relation with poverty.

Empirical Model

To examine the long run relationship among HCR, DX, FDI, INF, POP, GDP and SEDU, bounds testing approach to co-integration within the framework of Autoregressive Distributed Lag (ARDL) has been applied. The ARDL estimation technique was developed by Pesaran, *et al.* (2001). Bounds Test is useful for many reasons. First, this technique is more appropriate for small sample size [Pesaran, *et al.* (2001) and Tang (2001, 2002)]. Second, it evades pre-testing of unit roots. Third, short run and long run parameters are estimated simultaneously. Fourth, it is assumed that all variables are endogenous. Finally, this technique does not necessitate that in time series, variables in regression equation have order of integration as I (1). This test can be implemented without consideration of order of integration whether the variables have integrated order as I (0) or I (1) or integrated fractionally.

The representation of ARDL equation (1) is as follows:

$$\begin{aligned}\Delta HCR = {} & \beta_0 + \beta_1 LDX_{t-1} + \beta_2 LGDP_{t-1} + \beta_3 LFDI_{t-1} + \beta_4 LINF_{t-1} \\ & + \beta_5 LSEDU_{t-1} + \beta_6 LPOP_{t-1} + \sum_{i=0}^{k} \beta_7 \Delta LDX_{t-i} \\ & + \sum_{i=0}^{k} \beta_8 \Delta LGDP_{t-i} + \sum_{i=0}^{k} \beta_9 \Delta LFDI_{t-i} + \sum_{i=0}^{k} \beta_{10} \Delta LINF_{t-i} \\ & + \sum_{i=0}^{k} \beta_{11} \Delta LSEDU_{t-i} + \sum_{i=0}^{k} \beta_{12} \Delta LPOP_{t-i} + DUM01 + \varepsilon_t \quad \ldots \quad \ldots \quad (1)\end{aligned}$$

Where β_0 is intercept, Δ is operator for difference and ϵ_t is error term. All variables are expressed in logarithm form. The selected lag length is maximum 2 for difference variable for estimation of ARDL equation. Because of limited number of observations, all insignificant variables from model, by following general to specific technique, have been omitted. To check the reliability and accuracy of the model under estimation, different diagnostic tests have been applied.[8]

Bounds testing technique has been used to test the existence of the long run relationship between HCR and DX along with other variables by following Pesaran, *et al.* (2001). Null hypothesis is tested to implement bound test by considering the unrestricted error correction (UECM) for HCR and DX along with other variables. For this, a joint significance test is performed as follows:

$H_0 = \beta_0 = \beta_1 = \beta_2 = \ldots\ldots\ldots = \beta_7$

$H_1 \neq \beta_0 \neq \beta_1 \neq \beta_2 \neq \ldots\ldots\ldots \neq \beta_7$

This technique of bounds testing is based on F-statistics. The null hypothesis states that there is no co-integration between variables included in the model without considering the order of integration whether it is I (1) or I (1) and asymptotic distribution of F statistics is non-standard. To check the significance level, Pesaran, *et al.* (2001) computed two sets of critical values. Set one assumes that all variables have I (0) order of integration while other set assumes I (1) order of integration. If the estimated F-Statistics surpasses the upper critical bounds value, then the H_0 is rejected and if value of F-statistics remains below the lower critical bounds value, it suggests no co-integration. To check integration order, Augmented Dickey Fuller (ADF) unit root has been used. The descriptive statistics table is available at Appendix A.

IV. EMPIRICAL RESULTS AND DISCUSSION

The study has examined the role of Dexp whether they are pro-poor or anti-poor in Pakistan. First of all, order of integration of all variables included in the model has been analyzed by using ADF unit root by Dickey and Fuller (1979). The results are reported in Table 1.

Table 1

Results of ADF Unit Root

Variable	Constant (C) / Trend (T) Specification	Level (lags*)	Difference	Decision
HCR	C	–1.21 (3)	–2.46* (0)	I(1)
LFDI	C	–2.35 (0)	–7.44* (0)	I(1)
LDX	C	–3.05* (0)	–	I(0)
LGDP	C	–2.33 (1)	–3.88* (0)	I(1)
LPOP	C	–3.88* (8)	–	I(0)
LSEDU	C	–3.04 (1)	–	I(0)
LINF	C	–3.10* (4)	–	I(0)

**Note:* ADF test is based on the critical values by Mackinnon (1991). Lag Length is selected on basis of AIC. Significance level used is 5 percent.

[8]Such as LM test for serial correlation, ARCH test for heteroscedasticity, normality test and CUSUMSQ for structural stability.

The results of ADF Unit Root state that variables LDX, LPOP, LSEDU and LINF have integration order I(0) while variables HCR, LFDI and LGDP have order of integration as I(1). Due to presence of different order of integration, the most appropriate estimation technique is Autoregressive Distributed Lag (ARDL).

To test the long-run relationship, Ordinary Least Square (OLS) method has been used and results of Un-restricted Error Correction Model (UECM) / long run results have been reported in Table 2. The estimated UECM includes dummy variable[9] and also passed the diagnostic tests. The UECM has also been estimated by using slop dummy along with intercept dummy[10] and results are reported in Table 3. CUSUMSQ test has also been used to check the stability of model over time and results are reported in Figure 2.

Fig. 2. CUSUMSQ Test of Stability

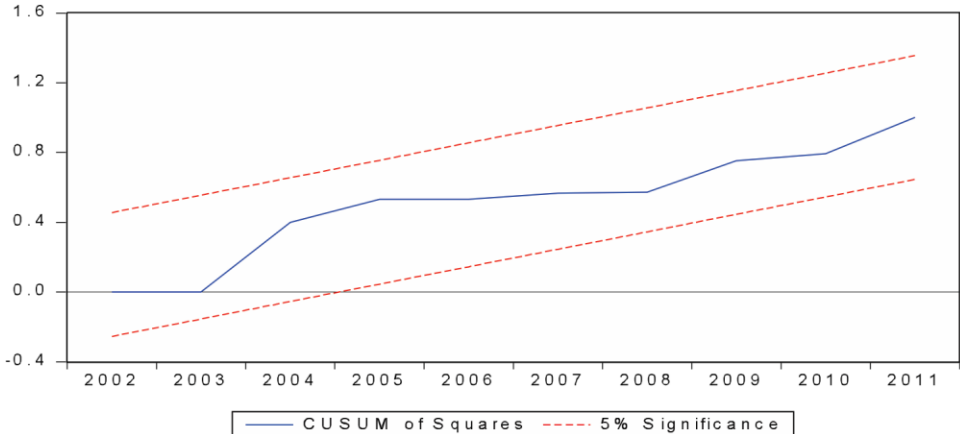


Table 2

Long Run Results with Intercept Dummy

Dependent Variable: DHCR

No. of included Observations: 36 after adjustments

Method: OLS [Newey-West HAC Standard Errors and Covariance (Lags included: 2)]

Variable	Coefficient	T-Statistics
DHCR(–2)	0.21	1.46
DLGDP	–33.14*	–3.26
DLFDI(–1)	–0.16	–0.38
DLDX(–1)	0.35	0.70
DLHCR	–311.38*	–2.45
DINF	–0.22*	–3.50

[9] Without including dummy variable, the results were spurious. Therefore, intercept dummy variable from 2001 onwards has been included. This is to check whether the shock of 9/11 impacted the Dexp which in turn have effect on poverty.

[10] The results show a small effect of all variables included in the model. All variables are showing significance in long run except DX. To check it, slop dummy has been used here.

HCR(–1)	–0.39*	–3.79
LGDP(–1)	–31.03*	–2.89
LFDI(–1)	1.25**	2.30
LPOP(–1)	41.45*	2.91
INF(–1)	–0.32*	–4.23
LDX(–1)	–0.99	–1.24
DUM01	–1.78**	–1.92
R-squared	0.75	
Adjusted R-squared	0.62	
Durbin-Watson stat	1.72	

Diagnostic Tests

	F-Statistics	P-Value
Breusch-Godfrey Serial Correlation LM Test	0.16	0.68
ARCH Test	1.06	0.31
Jarque Bera (Normality Test)	0.71	0.69
Ramsey RESET Test	2.90	0.11

Coefficient Diagnostic Tests

	F-Statistics	[Upper Bound: 1%, 5%]
Wald Test	4.18	[4.04, 3.24]

Note: Lag length are given in ( ). Critical values of Bounds Testing is given in [ ]. Breusch-Godfrey LM-test, ARCH test, and RESET test are based on F-statistics.

Table 3

Long Run Results with Intercept and Slop Dummy

Dependent Variable: DHCR
No. of included Observations: 36 after adjustments
Method: OLS [Newey-West HAC Standard Errors and Covariance (Lags included: 2)]

Variable	Coefficient	T-Statistics
DHCR(–2)	–0.41*	–2.86
DLGDP	–35.37*	–2.80
DLFDI(–1)	–0.53*	–2.37
DLDX(–1)*DUM01(–1)	4.40**	1.62
DLPOP	–349.12*	–5.31
DINF	–0.09	–1.70
HCR(–1)	–0.39*	–3.88
LGDP(–1)	–30.51*	–3.15
LFDI(–1)	1.29*	3.17
LPOP(–1)	40.63*	3.17
INF(–1)	–0.12*	–2.47

LDX(–1)*DUM01	–12.51*		–5.46
DUM01	11.70*		4.73
R-squared		0.88	
Adjusted R-squared		0.82	
Durbin-Watson stat		2.00	

All variables are showing significance both in short run and long run. Variables with 'D' indicate short run while variables in level 'L' designate long run. Defense expenditures (DX) that was showing no impact in simple ARDL model, now showing significance both in short and long run; however significance level in short run is 10 percent. The diagnostic tests confirm that model is stable and there is no problem of auto-correlation or heteroscedasticity. The coefficient diagnostic test shows that there exists co-integration between the variables included in the model. The value of F-statistics is 4.18 which is above from upper bound levels both at 1 percent and 5 percent. Therefore, the null hypothesis of no long run relationship has been rejected and it is concluded here that all long run variables are moving in same direction. LDEXP after multiplying with dummy variable shows significance in the long run but the coefficient is negative. LGDP is also significant and impacting poverty negatively as hypothesized. LFDI is also indicating significance with a negative sign. LPOP is also significant and coefficient is positively contributing to poverty that is 1 percent increase in population increases poverty up to 40 percent. Inflation (INF) is significant but the sign is negative. The variable SEDU was omitted from model because the result was insignificant both in short run and long run.

After getting long run coefficient, we normalized the coefficient by generating estimated coefficients series. Lastly, ECM has been estimated by using following Equation (2):

$$\Delta POV = \beta_1 + \beta_2 \Delta POV_{t-1} + \beta_3 \Delta LDX_{t-1} * Dum01 + \beta_4 \Delta LFDI_{t-1} + \beta_5 \Delta INF + \beta_6 \Delta LGDP + \beta_7 \Delta POP + \eta ECM_{t-1} + Dum01 + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Table 4

Short Run Results

Dependent Variable: DHCR
No. of included Observations: 36 after adjustments
Method: OLS [Newey-West HAC Standard Errors and Covariance (Lags included: 2)]

Variable	Coefficient	T-Statistics
DHCR(–1)	0.38**	1.99
DLGDP	–26.26*	–2.590
DLFDI	0.30	0.83
DLDX(–1)*DUM01	–3.71**	–2.28
DLPOP	–208.16**	–2.43
DINF	–0.21*	–2.40
EC(–1)	–0.26**	–2.61
DUM01	–1.18**	–3.16
AR(1)	–0.33	–1.81
R-squared	0.80	
Adjusted R-squared	0.74	
Durbin-Watson stat	2.05	

EC = –30.51/0.39LGDP+1.29/0.39LFDI+40.63/0.39LPOP0.12/0.39INF+-12.51/0.39LDX
= 78.23LGDP+3.30LFDI+104.17LPOP-0.31INF-32.07LDX

Note: * and ** Indicate the level of significance at 1 percent and 5 percent respectively.

The results indicates that all variables are significant in short run expect FDI. The coefficient of Error Correction (EC) is negative and significant [–0.26 (0.02)]. Annual rate of adjustment is 26 percent. The result indicates that DX, GDP, POP and INF have negative relation with poverty. FDI has positive sign but insignificantly related with poverty.

The defense expenditure (DX) has negative and significant relation with poverty both in short and long run. The sign is negative which shows that Dexp do not elevate poverty in Pakistan. The Military Keynesian Hypothesis of negative relation of Dexp with poverty is not rejected here. The results are contrary to the findings of Kalim and Hassan (2013) where military expenditures have a positive and significant relationship with poverty. The justification may be that the Dexp in Pakistan have been increasing but at diminishing rate.

The impact of GDP on poverty is negative and significant both in short and long run. The increase in GDP indicates increase in employment opportunities, increase in income of poor people, hence reducing poverty.

FDI has positive and significant impact on poverty in the long run but insignificant in short run. This may be justified as instead of providing jobs to unskilled labour, FDI is providing employment in selected service sectors like telecommunications and financial service sectors. Findings are also supported by Kalim and Shahbaz (2009).

The results show that Inflation (INF) has negative and statistical significant relation with poverty both in short and long run. Pakistan is a lower middle income country and empirical literature supports these findings that in low and lower-middle income countries the relationship between inflation and poverty can be negative as observed by Talukdar (2012).

Population (POP) has positive and significant impact on poverty in long run. But the impact is negative in short run. This can be justified as many population and birth control methods have been introduced by the government and now population is increasing at decreasing rate in the country. The population growth rate in Pakistan has shown improvement and it decreased from 2.05 percent (2010-11) to 2.03 percent in 2011-12 and 2.00 percent in 2012-13.[11]

V. CONCLUSION AND POLICY IMPLICATIONS

Efficient expenditure management is an important economic tool for poverty reduction strategies and key development goals because it creates adequate fiscal space which is required to reinforce the provision of public services like health, education, and basic infrastructure. However, in this regard, composition of public expenditure plays a decisive role. The allocation of defense expenditure in developing economies like Pakistan is one of the contentious policy issues. Therefore, the issue of defense expenditure and poverty has been investigated by using time series data-set over the period 1973-2011 by applying ARDL bounds testing approach to cointegration, relationship between Dexp and poverty alongwith other explanatory variables.

This paper investigated the impact of Dexp, inflation, foreign direct investment, GDP and population on poverty for both long term and short term for the dataset ranging from 1973-2011. The results have shown that Dexp are not anti-poor in Pakistan both in

[11] *Pakistan Economic Survey 2012-13.*

the short and long run. They do not elevate poverty level. But Population and FDI are the contributing factors to poverty in the long run. Pakistan has been striving hard to attract FDI, but in recent past only services sectors attracted considerable FDI.

Military has perfected itself as an institution in Pakistan. There are many positivities attached with the defense sector. Besides ensuring national security, it has played its role in many other crucial areas for example conduct of population census and general elections, rescue, relief and rehabilitation processes during and after natural disasters (earthquake and floods), maintenance of law & order especially on religious occasions.

The empirical findings of the study may entail several policy implications. The findings show that Dexp are not anti-poor in Pakistan and these do not deteriorate the incidence of poverty in the country. In recent Past, attempts have been made to rationalize Dexp and these were presented in the Parliament of Pakistan. The current geo-strategic situation in the region does not also favour to reduce Dexp. Policy-makers may rationalize other government expenditures by increasing the size of Public Sector Development Program (PSDP) and reducing the size of unproductive expenditure. It is widely accepted that FDI is most useful tool for economic development and long run growth for a country in comparison to other forms of capital inflows. But unfortunately Pakistan has not been successful in attracting a larger share of investment despite investor friendly policies. Pakistan has recently experienced a short surge in FDI inflows, but these have confined to services sector especially telecommunication and financial businesses. The policy-makers need to revisit investment policies and attract investment in other sectors of the economy that generates employment in the country. As a result, poverty will also be reduced.

The study has used headcount ratio as proxy for poverty. This variable has its own limitations. The study can be extended for future research by using multiple poverty index as phenomenon of poverty is multifaceted.

APPENDIX A

	Descriptive Statistics					
	HCR	LDX	LGDP	LINF	LPOP	LSEDU
Mean	25.93821	0.821066	24.79571	2.128626	18.54021	0.840374
Median	23.90000	0.982864	24.91272	2.179053	18.58017	0.827184
Maximum	45.75000	2.993760	25.61419	3.283278	18.98694	1.106018
Minimum	12.40000	–0.811356	23.80318	1.069573	17.97906	0.608580
Std. Dev.	7.473527	0.716300	0.560944	0.542166	0.311785	0.149078
Skewness	0.777391	–0.137418	–0.272739	–0.017894	–0.273043	0.003758
Kurtosis	3.405281	4.393420	1.879696	2.662085	1.797437	1.726144
Jarque-Bera	4.195098	3.277878	2.523019	0.187634	2.834598	2.636995
Probability	0.122757	0.194186	0.283226	0.910449	0.242368	0.267537
Sum	1011.590	32.02158	967.0326	83.01640	723.0681	32.77458
Sum Sq. Dev.	2122.437	19.49727	11.95703	11.16985	3.693984	0.844527
Observations	39	39	39	39	39	39

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Comments

The paper titled "Is Defense Expenditure Pro Poor or Anti Poor in Pakistan? An Empirical Investigation" touches upon a critical and much debated topic for Pakistan. As a student we see that in macroeconomics we have the **G** increasing normally for the war and not for any non-defense expenditures. Secondly like environmental economic issues such as **climate change** where we have a risk averse behaviour and rather then trying to experiment in letting the change happen and then learn from it we mitigate. Same is true for defense, can we take the risk of taking it to that level where it could be costly for us, can we assume that Defense expenditures don't have economic benefits.

Having said that let me point out some of the weakness which to my understanding if improved can make this paper very useful both for academia and policy-makers.

(i) Title needs to be in plural.
(ii) Key words Defense and Military are the same.
(iii) Author has referred to Defense expenditures where ever mentioned in the paper as defense burden, whereas the latter is not even proved yet. Further it is also reported by the authors that the relative level of defense expenditure as a percentage of GDP is on the decline.
(iv) It is stated in the paper that Defense expenditures crowd out investment, to me simple statement is not enough and needs thorough follow up in literature.
(v) The literature review fascinates me as to a number of studies have been put forth for the growth impeding defense expenditures and growth promoting ones, but authors fail to dilute the situation as to what could be the reasons/justification for such qualifying statements. Is it the nature of defense expenditures what makes say for same countries results to differ, or is the methodology of estimation, or is it the country specificity or war time which matters. Please add some commentary as to why these starch differences to this debate.
(vi) One issue throughout the paper that the theoretical underpinning for this study is based on a single statement that these expenditures crowd out growth leading expenditures such as Health and education, then it becomes a question of relative costing, it could be others which may have more opportunity cost such as current expenditures, or interest payment.
(vii) BISP (page 4) itself doesn't report something; it must be some report or a study.
(viii) Authors have used a number of data sources, such as SBP, Economic survey and WDI. Sometimes due to reporting definitions and accounting practices the figures may be different, e.g. GDP from Economic survey and expenditures from SBP hand book may result in an otherwise different picture. Secondly is the GDP data adjusted for rebasing which happened at regular periods? Thirdly the authors have extrapolated the data for poverty from 2003-2012, meaning 9 years. Which already for the earlier years there

is no continuous reporting of the poverty would be an extrapolated value. I was curious to see what figure does their extrapolation method come up with and compare it with the outcomes being discussed here at the conference. Couldn't find them.

(ix) Certain surprising reporting, page 6, Defense expenditures to be more than 60 percent of the total federal government expenditures (which might include both development and current expenditures I guess).

(x) Figure 2, if these are shares then why don't they total to 100 in the earlier periods, and what happened after 1998-99 there is a sudden jump and the shares are visible. Consequently there is no discussion on the latest pen picture of the situation.

(xi) Qualifying statements based on judgments could be risky; such "devolved from federal…. We can expect improvement in their budgetary allocations". There has been quite some time now to that and if it were the case it could be actually seen. Further terms such as "debt trap" and "distorting resources" page 8, are definitions and requires evidence based statements.

(xii) Section III on Theoretical Underpinning is in dire need of the underpinnings, as I am unable to find the direct channel which this paper explores where there could be a 1-1 correspondence between defense expenditures and poverty. More of a theory less estimation.

(xiii) There is repetition in literature outcomes sited. The length of the literature could be drastically reduced by clubbing them in some order. E.g. region wise, or may be outcome based. Finally the author seems to find nobody working on this issue for Pakistan.

(xiv) For the estimation part; equation 1 has serious anticipated problem of multicollinearity which is also not rejected with relevant testing afterwards, e.g. GDP would be highly collinear with GDP per capita, Public spending on Education, FDI. Just curious how much does GDP and GDP per capita variable definition is different?

(xv) Now a days a number of Stationary tests are used to get robust results, check them.

(xvi) Stationarity results show some variables to be of I(1) and some of I(0). And the authors have used OLS. So I stop here. Use the ARDL method and then report the results.

(xvii) Finally there is editing requirement and when you draft again after re-estimating the model, please try to provide policy implications based on your findings.

Over all the study needs a thorough revision both in the context of theoretical understanding and the econometric methodology on how to estimate it.

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